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EXAMINER	
MUI, GARY	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/687,798
Filing Date: October 17, 2003
Appellant(s): JI, MINWEN

Jonathan M. Harris
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 11, 2008 appealing from the Office action mailed March 18, 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 4,905,233	Cain et al.	2-1990
US 6,381,252	Li et al.	4-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 – 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Cain et al. (US 4,905,233; hereinafter "Cain").

For claim 1, Cain teaches forwarding a packet along a first link of the multipath network; tracking a load of the first link subsequent to forwarding the packet; and preserving the first link for a subsequent packet having the same flow address as the forwarded packet upon determining a desired load change of the first link is less than a predetermined value (see column 2 lines 36 – 55; packets are forwarded along a virtual circuit in a multinode communications network where the virtual circuit will remain dedicated for the connection between the source and destination until rerouting is required, for example traffic congestion).

For claim 2, Cain teaches modifying link designations to forward packets along upon determining the desired load change of the first link is greater than the predetermined value (see column 21 line 32 – column 2 line 3).

For claim 3, Cain teaches modifying link designations comprises designating a second link to send the subsequent packet along (see column 21 line 31 – column 2 line 3).

For claim 4, Cain teaches modifying link designations comprises preserving the link to send the subsequent packet along (see column 21 line 31 – column 2 line 3).

For claim 5, Cain teaches tracking the load comprises tracking one or more variables associated with the load of the first link (see column 22 lines 4 – 43).

For claim 6, Cain teaches the one or more variables comprise bandwidth of the first link (see column 22 lines 4 – 43).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 7 – 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cain in view of Li et al. (US 6,381,252 B1).

For claims 7 and 8, Cain teaches all of the claimed subject matter with the exception of the one or more variables comprise a delay of the first link and the one or more variable

comprises a loss rate of the first link. Li from the same field of endeavor teaches in the background the communication attributes measured can relate to that at least one parameter such as latency, packet lost rate, and bandwidth (see column 2 lines 40 – 42). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to the variable be a delay or loss rate as taught by Li into the multiple path routing mechanism of Cain. The motivation for doing this is with more variables used in calculations the system will become more efficient.

For claim 9, Cain teaches to partition traffic flow through a multipath network (see column 2 lines 36 – 55; traffic is sent across a multinode network and a route selection will distribute the load). Cain fails to teach to adjust positions of one or more pointers used to partition traffic flow through a multipath network, wherein the positions of the one or more pointers are variable relative to a range of hash units that correspond to flow addresses within the multipath network. Li from the same field of endeavor teaches the use of pointers for selecting a channel (see column 4 lines 17 – 54). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the pointers a taught by Li into the multiple path routing mechanism of Cain. The motivation for doing this is allow for easy management of the plurality of network resources. Cain and Li also fails to teach the use of a hash unit, however hashing is well known at the time of the invention and therefore hash unit can be used in Cain's multiple path routing mechanism because hashing allows for a increase the speed of the system.

For claim 10, Cain fails to teach adjusting the positions of the one or more pointers comprise program instructions for modifying a position of one pointer at a time. Li from the same field

of endeavor teaches the use of pointers for selecting a channel (see column 4 lines 17 – 54). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the pointers a taught by Li into the multiple path routing mechanism of Cain. The motivation for doing this is allow for easy management of the plurality of network resources.

For claim 11, Cain teaches tracking the load of the network links (see column 22 line 4 – 43) but fails to teach modifying a hash number of a first pointer positioned between a highest loaded link and a least loaded link; and subsequently modifying a hash number of a second pointer positioned between a second highest loaded link and a second least loaded link. Li from the same field of endeavor teaches the use of pointers, a first and a second that are adjusted, for selecting a channel (see column 4 lines 17 – 54). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the pointers a taught by Li into the multiple path routing mechanism of Cain. The motivation for doing this is allow for easy management of the plurality of network resources.

For claim 12, Cain fails to teach adjusting the positions of the one or more pointers are directed for use by an individual router of the multipath network. Li from the same field of endeavor teaches the use of pointers for selecting a channel (see column 4 lines 17 – 54). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the pointers a taught by Li into the multiple path routing mechanism of Cain. The motivation for doing this is allow for easy management of the plurality of network resources.

For claim 13, Cain teaches calculating an average amount of load per hash unit for individual links coupled to the router; and calculating a desired load change on the individual links (see column 22 lines 4 – 23).

For claim 14, Cain teaches selecting a link of the multipath network to send a packet along (see column 22 lines 4 – 23). Cain fails to teach a hash number representative of a flow address of the packet and relative hash numbers of one or more the pointers. Li from the same field of endeavor teaches the use of pointers for selecting a channel (see column 4 lines 17 – 54). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the pointers a taught by Li into the multiple path routing mechanism of Cain. The motivation for doing this is allow for easy management of the plurality of network resources.

For claim 15, Cain fails to teach hashing the flow address of the packet. However, hashing is well known at the time of the invention and therefore hash unit can be used in Cain's multiple path routing mechanism because hashing allows for an increase the speed of the system.

For claim 15, Cain teaches multiple ports for coupling to links of a network and selectively directing a data packet to one of the multiple ports (see column 2 line 24 – 55 and figure 3, nodes connected through multiple links and a route selection will choose the optimal route). Cain fails to teach a storage medium comprising program instructions executable using a processor for selectively directing a data packet to one of the multiple ports; and altering one or more of the conditions by which the data packet is selectively directed. . Li from the same field of endeavor teaches the use of pointers, a first and a second that are adjusted, for selecting a channel (see column 4 lines 17 – 54). Therefore, it would have been obvious to

one of ordinary skill in the art at the time of the invention was made to use the pointers a taught by Li into the multiple path routing mechanism of Cain. The motivation for doing this is allow for easy management of the plurality of network resources

For claim 17, Cain fails to teach the one or more conditions comprise hash number values of one or more variable pointers configured to partition a range of hash numbers associated with possible flow addresses of the data packet. Li from the same field of endeavor teaches the use of pointers for selecting a channel (see column 4 lines 17 – 54). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the pointers a taught by Li into the multiple path routing mechanism of Cain. The motivation for doing this is allow for easy management of the plurality of network resources. Cain and Li also fails to teach the use of a hash unit, however hashing is well known at the time of the invention and therefore hash unit can be used in Cain's multiple path routing mechanism because hashing allows for a increase the speed of the system.

For claim 18, Cain fails to teach the one or more conditions comprise specific hash number ranges associated with possible flow addresses of the data packet. However, hashing is well known at the time of the invention and therefore hash unit can be used in Cain's multiple path routing mechanism because hashing allows for an increase the speed of the system.

For claim 19, Cain fails to teach altering the one or more conditions to reflect a load balancing policy of the router. Li from the same field of endeavor teaches the use of the pointers that adjusted to reflect the selected channel where the selected channel is from examining its status (see column 4 line 17 – 54). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the pointers a taught by Li into the

multiple path routing mechanism of Cain. The motivation for doing this is allow for easy management of the plurality of network resources.

For claim 20, Cain fails to teach accounting for the capacity of the links coupled to the multiple ports when the one or more conditions are altered. Li from the same field of endeavor teaches the use of the pointers that adjusted to reflect the selected channel where the selected channel is from examining its status (see column 4 line 17 – 54). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the pointers a taught by Li into the multiple path routing mechanism of Cain. The motivation for doing this is allow for easy management of the plurality of network resources.

For claim 21, Cain fails to each altering the one or more conditions to monotonically balance loads between two of the multiple ports. Li from the same field of endeavor teaches the use of the pointers that adjusted to reflect the selected channel where the selected channel is from examining its status (see column 4 line 17 – 54). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the pointers a taught by Li into the multiple path routing mechanism of Cain. The motivation for doing this is allow for easy management of the plurality of network resources.

For claim 22, Cain fails to teach redirecting the data packet to another of the multiple ports upon detecting the one multiple port cannot accept the data packet. Li from the same field of endeavor teaches the use of the pointers that adjusted to reflect the selected channel where the selected channel is from examining its status and will adjust pointer again until it finds a positive status (see column 4 line 17 – 54). Therefore, it would have been obvious to one of

ordinary skill in the art at the time of the invention was made to use the pointers a taught by Li into the multiple path routing mechanism of Cain. The motivation for doing this is allow for easy management of the plurality of network resources.

For claim 23, Cain teaches multiple stations configured to send and receive data packets; and a plurality of routers interposed between the multiple stations and interconnected by a mesh of links, wherein each router is configured to selectively direct a first packet along a link coupled thereto in accordance with one or more variable pointers included within the router; and record the status of the one or more variable pointers to direct a second packet having the same source and flow addresses as the first packet along the same link (see column 2 line 36 – 55; in a multinode network packets are sent along a virtual circuit). Cain fails to teach the use of pointers. Li from the same field of endeavor teaches the use of pointers for selecting a channel (see column 4 lines 17 – 54). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the pointers a taught by Li into the multiple path routing mechanism of Cain. The motivation for doing this is allow for easy management of the plurality of network resources.

For claim 24, Cain fails to teach alter the position of one or more variable pointers. Li from the same field of endeavor teaches the use of pointers for selecting a channel (see column 4 lines 17 – 54). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the pointers a taught by Li into the multiple path routing mechanism of Cain. The motivation for doing this is allow for easy management of the plurality of network resources.

For claim 25, Cain teaches tracking the load conditions of the links coupled thereto (see column 22 lines 15 – 43).

For claim 26, Cain teaches at least one router of the plurality of routers comprises a means for changing transmission control protocol connections among links of differing loss rates associated with the router (see column 22 lines 15 – 43).

(10) Response to Argument

Regarding claim 1, the appellant argued that, "...claim 1 requires after forwarding a packet on a first link, tracking the load on the first link. Claim 1 then requires not changing the link ("preserving the link") for a subsequent packet having the same flow address if the "desired load change" of the link is determined to be less than threshold value" on page 10. In response to the appellant arguments the examiner respectfully disagrees. The Cain et al. (hereinafter "Cain") reference, which was used to rely upon for this claimed feature, teaches that a route form source to destination will remain dedicated for that purpose until rerouting is required, either due to a link failure along the route or due to traffic congestion (see column 21 lines 55 – 59) and to maintain an average load on the link to minimize congestion (see column 22 lines 15 – 34). Thus, the Cain reference showing that the link with remain dedicated ("preserved") for the length of the transmission or until a failure or congestion; wherein congestion of the link is based on the average load value of the link.

In response to the appellant argument of impermissible hindsight for claims 7 - 8 on page 12, the examiner respectfully disagrees. The Li et al. (hereinafter "Li") teaches managing and allocating communication resources which provides for relatively equal utilization of the communication

resources, and which avoids potential resource malfunctions due to overuse (see column 2 line 45 – 50).

In response to the appellant arguments of the Li references does not teach "using one or more pointer to partition traffic flow by defining boundaries between rages of hashed flow addresses" of claim 9. The examiner respectfully disagrees. In the Li reference it teaches the use of pointers to select a channel where the channel can be a positive or negative status so that the flow of the data is controlled and the there is a range of channel number that it can select from and were the channel numbers can be hashed (see column 4 lines 17 – 54 and figure 3). Where hashing is a modification of the value and the Li references teaches the modification of a pointer value. This is also applicable to the argument presented on page 13 for claims 11 and 14.

Regarding the appellants argument for claim 16 on page 13 where independent claim 16 claims similar features as claim 9 and for the presented above reasons of claim 9, independent claim 16 is rendered obvious by the cited prior art.

Regarding the appellants arguments for claim 20 on page 14 that the Li reference does not teach "accounting for the capacity of the links". The Li reference teaches to determine the positive or negative status of the link like buys or idle (see column 4 lines 14 – 54).

Regarding the appellants argument for claim 23 on page 14 where independent claim 23 claims similar features as claim 9 and for the presented above reasons of claim 9, independent claim 23 is rendered obvious by the cited prior art.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Conclusion

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Gary Mui/

Examiner, Art Unit 2416

Conferees:

/Ricky Ngo/

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10/27/08